

The background of the slide is a collage of various brain MRI slices. These include axial, sagittal, and coronal views of the brain, showing different internal structures like the ventricles and cortical areas. The slices are in grayscale, typical of medical imaging. Some slices have technical labels like 'AP 26 pos', 'Sc 6', 'T1W/FLAIR', and 'AP 22' visible on them. The overall layout is a grid-like arrangement of these medical images.

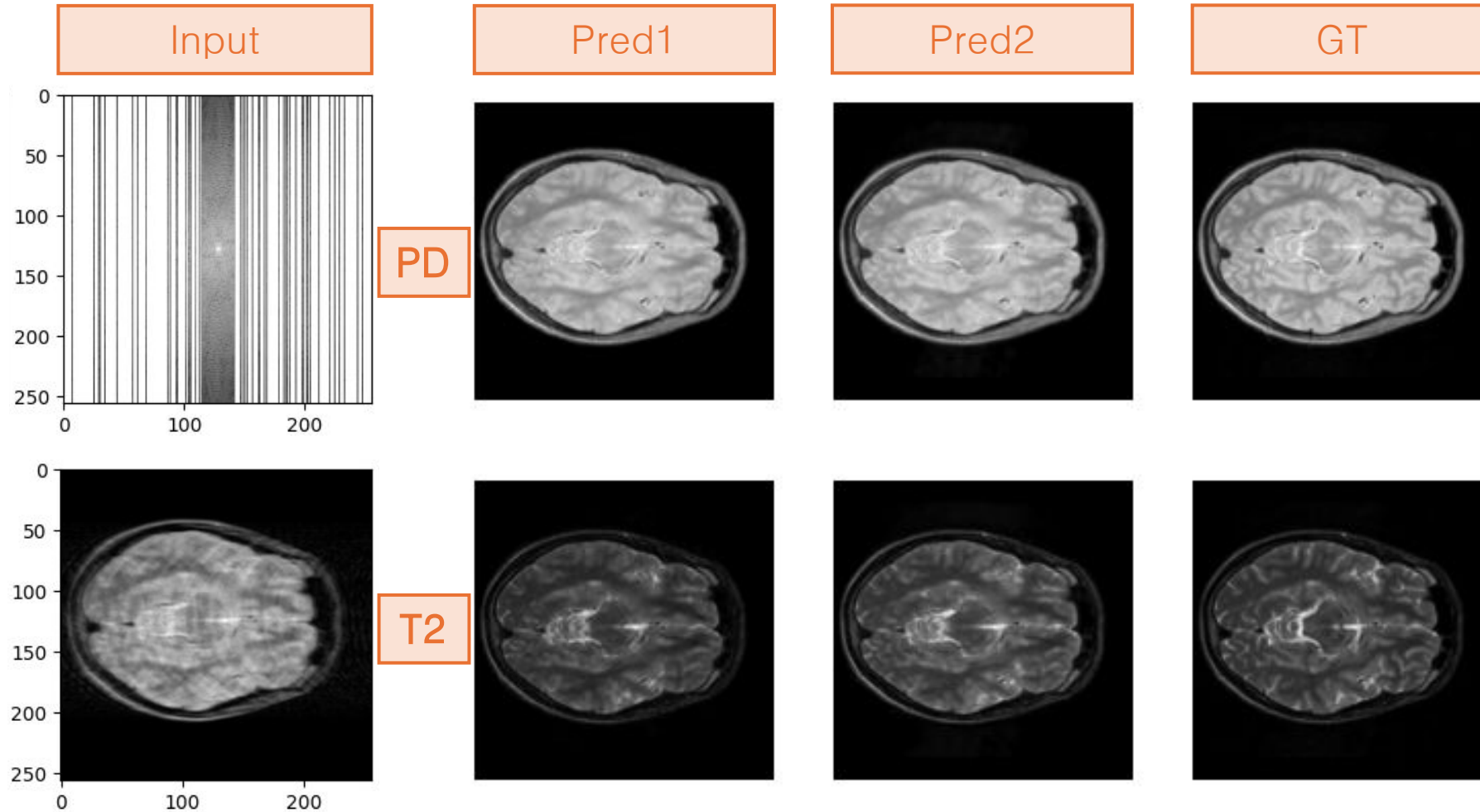
MANTIS: Implementation

Hyunjong Kim

Results

$$R_{\text{under}} = 3, \lambda_{\text{data}} = 0.1, \lambda_{\text{cnn}} = 1.0, LR = 0.0002$$

(Case1 \rightarrow Case2: Masking improved)

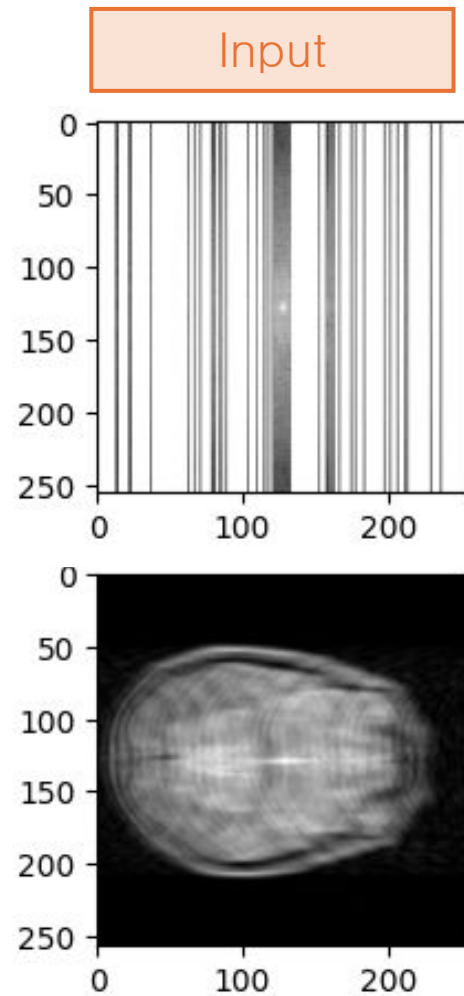


SSIM(%)	
Pred1	Pred2
86.03	89.46
nRMSE(%)	
Pred1	Pred2
2.47	2.18

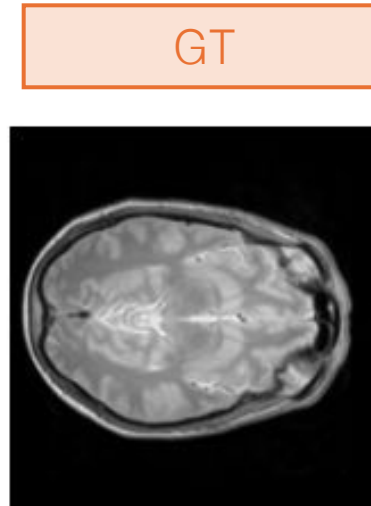
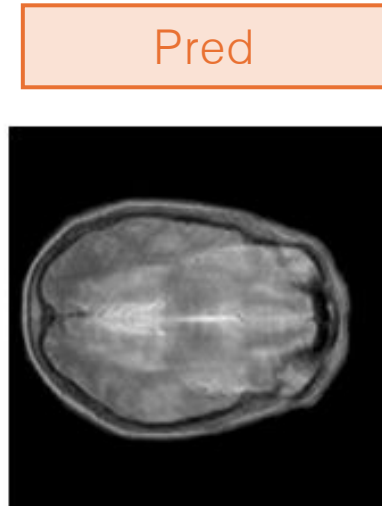
SSIM(%)	
Pred1	Pred2
83.74	86.24
nRMSE(%)	
Pred1	Pred2
3.62	3.52

Results

$$R_{under} = 5, \lambda_{data} = 0.2, \lambda_{cnn} = 1.0, LR = 0.0005$$



PD



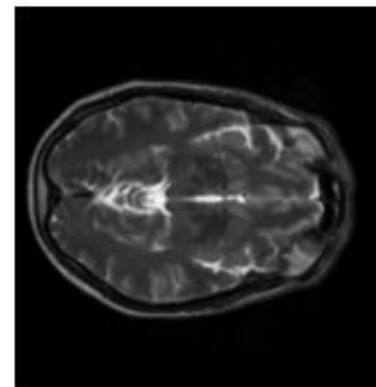
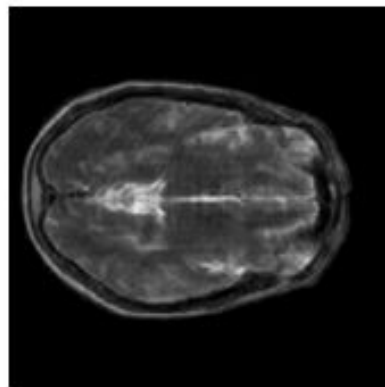
SSIM(%)

81.38

nRMSE(%)

5.97

T2



SSIM(%)

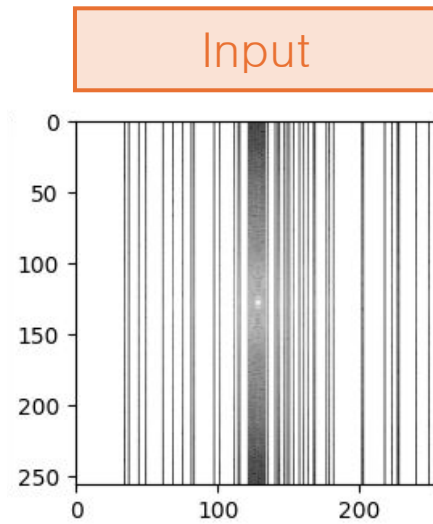
74.89

nRMSE(%)

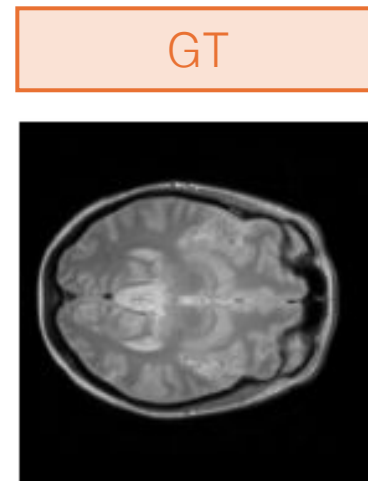
6.20

Results

$$R_{\text{under}} = 5, \lambda_{\text{data}} = 0.2, \lambda_{\text{cnn}} = 1.0, LR = 0.0006, \text{gamma} = 0.95$$



PD

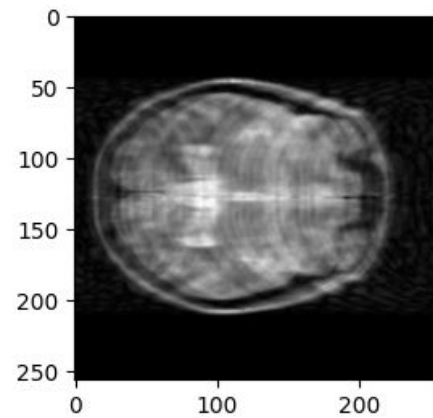


SSIM(%)

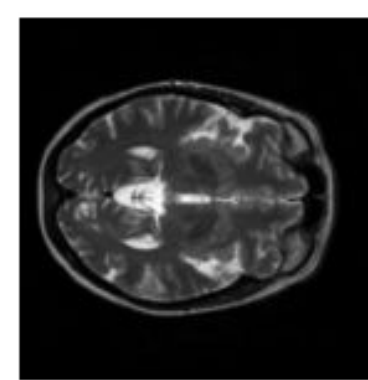
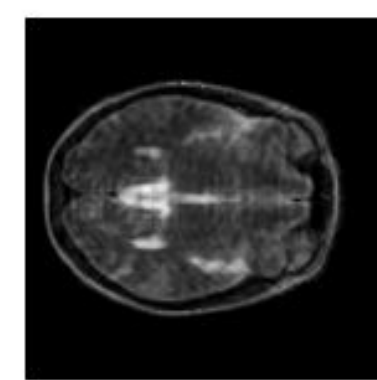
80.67

nRMSE(%)

3.71



T2



SSIM(%)

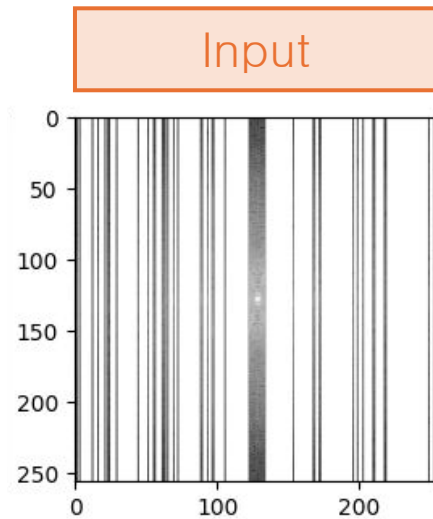
77.91

nRMSE(%)

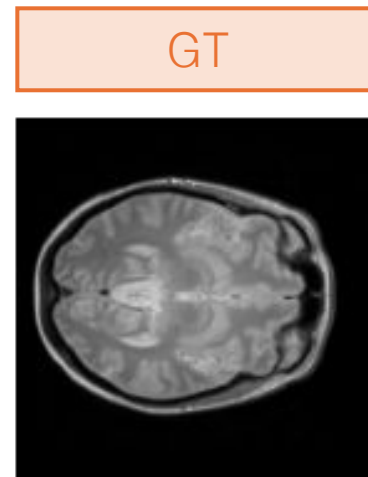
4.85

Results

$$R_{\text{under}} = 5, \lambda_{\text{data}} = 0.3, \lambda_{\text{cnn}} = 1.0, LR = 0.0005, \text{gamma} = 0.95$$



PD

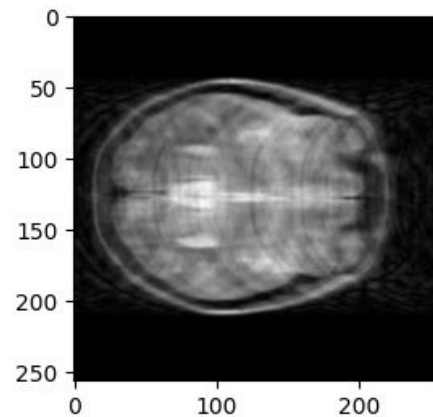


SSIM(%)

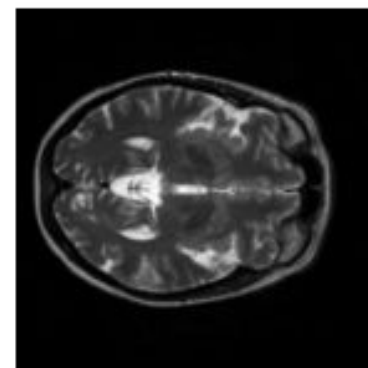
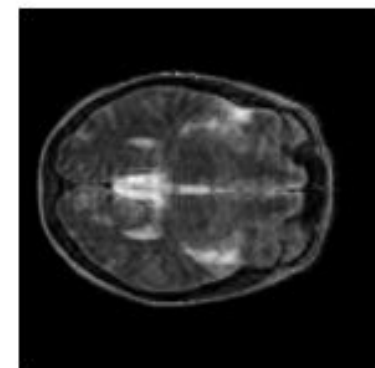
79.51

nRMSE(%)

4.50



T2



SSIM(%)

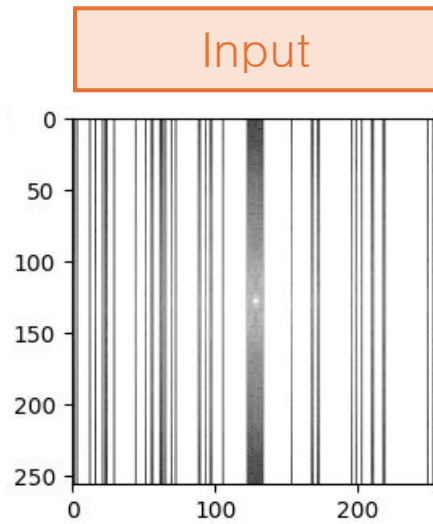
76.59

nRMSE(%)

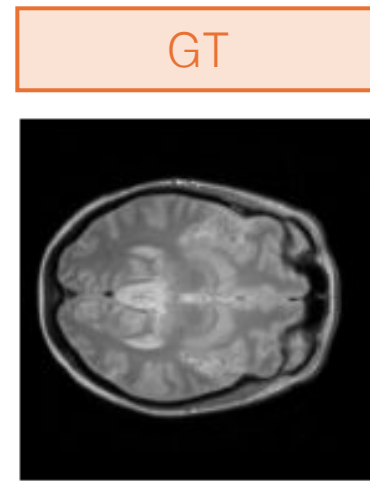
5.40

Results

$$R_{\text{under}} = 5, \lambda_{\text{data}} = 0.5, \lambda_{\text{cnn}} = 1.0, LR = 0.0003, \text{gamma} = 0.9$$



PD

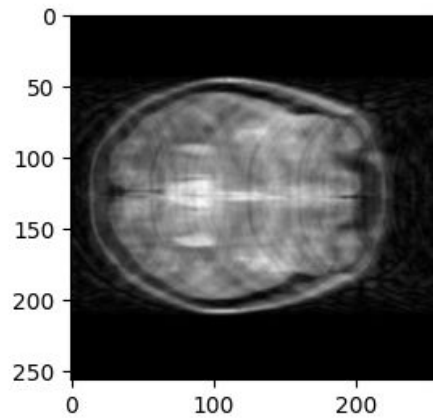


SSIM(%)

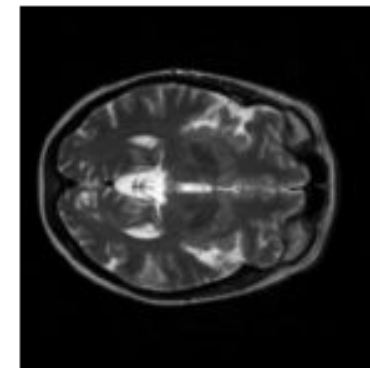
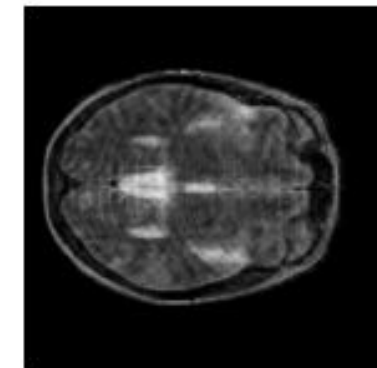
72.61

nRMSE(%)

6.81



T2



SSIM(%)

72.25

nRMSE(%)

6.16

Ours vs. MANTIS

TABLE 1 nRMSE and SSIM between the reference T_2 maps estimated from the fully sampled images and the reconstructed T_2 maps estimated using undersampling patterns

Methods	Mean \pm SD at R = 5		Mean \pm SD at R = 8	
	nRMSE (%)	SSIM (%)	nRMSE (%)	SSIM (%)
GLR	13.5 ± 4.3	72.5 ± 3.7	15.0 ± 3.9	63.2 ± 4.5
LLR	12.2 ± 3.5	70.4 ± 3.1	13.9 ± 3.5	59.2 ± 3.3
k-t SLR	9.8 ± 2.4	77.5 ± 3.3	11.6 ± 2.9	70.5 ± 3.6
ALOHA	8.9 ± 2.1	80.3 ± 3.5	10.9 ± 2.7	72.6 ± 3.8
U-Net Imaging + T2 Fitting	6.5 ± 2.0	83.5 ± 3.1	8.8 ± 2.9	76.2 ± 3.2
U-Net Mapping	6.9 ± 1.8	82.3 ± 2.8	8.5 ± 2.5	78.0 ± 2.5
MANTIS	6.1 ± 1.5	86.2 ± 1.9	7.1 ± 1.8	82.1 ± 2.3

Results were averaged over the 10 test patient data sets and represent mean value \pm SD. MANTIS achieved the highest reconstruction performance with the smallest errors at both R = 5 and 8.

	Ours	MANTIS
SSIM(%)	74.9	86.2
nRMSE(%)	6.2	6.1